

## عنوان مقاله:

Isolation and molecular characterization of the RecQsim gene in Arabidopsis, rice (*Oryza sativa*) and rape (*Brassica napus*)

## محل انتشار:

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## خلاصه مقاله:

In any organism that reproduces sexually, DNA Recombination plays vital roles in the generation of allelic diversity as well as in preservation of genome fidelity. Genome fidelity is particularly important in plants because mutations occurring during the development of flowering plants are heritable and can be passed onto the next generation. One of the gene families that play crucial roles in the regulation of DNA recombination and repair is the RecQ family of DNA helicases. In flowering plants, RecQ family members have only been characterized in Arabidopsis. Among all RecQ family members, the Arabidopsis RecQsim is distinct in that there is a substantial insertion (of around 100 amino acids) inside its helicase domain. We previously showed that this novel RecQ homologue is expressed in various organs of Arabidopsis and rice. We also showed that the Arabidopsis RecQsim gene when ectopically expressed in yeast RecQ deficient (*sgs1*) cells, can partially compensate for the absence of SGS1. Here, we perform an evolutionary analysis of RecQsim orthologues isolated from rice and rape together with other known plant RecQ family members. Furthermore, isolation and molecular characterization of two Arabidopsis recQsim knockout mutants is explained. The position of T-DNA integration suggests that the recQsim-1 is likely to be a real knockout while recQsim-2 is expected to be a knockdown mutant. Segregation analysis of the T-DNA selectable marker together with Southern hybridization revealed that in both isolated mutant lines a single copy of the T-DNA is inserted into the genome. Analysis of these mutant lines will provide evidence on the roles that RecQsim plays in DNA recombination and the regulation of leaf senescence in plants and may open new insights into how plants respond to various environmental challenges.

## کلمات کلیدی:

Arabidopsis, Brassica, DNA recombination, RecQ, Rice

